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EXAMINER	
BELL, MELTIN	

ART UNIT	PAPER NUMBER
2121	6

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/043,515	GOLDWASSER ET AL.	
	Examiner	Art Unit	
	Meltin Bell	2121	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 March 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-52* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-52* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 March 2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *4-5*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

This action is responsive to application **10/043,515** filed 03/26/01.

Claims 1-52 have been examined.

Priority

Applicant's claim for domestic priority against application number 60/191,783 filed **3/24/00** under 35 U.S.C. 119(e) is acknowledged.

Information Disclosure Statement

Applicant is respectfully reminded of the ongoing Duty to disclose 37 C.F.R. 1.56 all pertinent information and material pertaining to the patentability of applicant's claimed invention, by submitting in a timely manner PTO-1449, Information Disclosure Statement (IDS) with the filing of applicant's application or thereafter.

The information disclosure statement filed 3/14/03 fails to comply with the provisions of 37 CFR 1.97, 1.98 and MPEP § 609 because of missing or inaccurate information in the listing:

- The website for the Umpire Screen jpeg file is incorrect.

It has been placed in the application file. Applicant is advised that the date of any re-submission of any item of information contained in this information disclosure statement or the submission of any missing element(s) will be the date of submission for purposes of determining compliance with the requirements based on the time of filing the

statement, including all certification requirements for statements under 37 CFR 1.97(e). See MPEP § 609 ¶ C(1).

Drawings

The United States Patent and Trademark Office of Draftsperson's Patent Drawings Review have reviewed the formal drawings. Reasons for any Draftsperson objections under 37 CFR 1.84 or 1.152 will be indicated on the Form PTO-948, Notice of Draftsperson's Patent Drawing Review, if attached.

The drawings have not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is required in correcting any errors of which applicant may become aware in the drawings.

The drawings are objected to because:

- The memory and processor components of computer systems 110 and 130 in Fig. 1 should be shown as suggested on page 7, lines 27-28.
- Fig. 2, item 200 and its link should terminate closer to the customer information text in the Figure. Subsystem should also be appended to the text as suggested on page 8, line 5.
- Subsystem should be appended to the text of Fig. 2, item 220 as suggested on page 8, line 6.
- Fig. 4 is missing the flowchart/program/method Start symbol terminating at item 400.

- Fig. 2, item 210 and its link should terminate closer to the inventory subsystem text in the Figure.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

The specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is required in correcting any errors of which applicant may become aware in the specification.

The disclosure is objected to because of the following informalities:

- 22 should be 220 on page 11, line 7.
- Experiment should be results on 1) page 11, line 22; 2) page 14, line 5; 3) page 18, line 31; 4) page 19, line 24; 5) page 20, lines 11 and 28.
- 210 should be 220 on page 15, line 11.
- 130 should be 150 on page 18, line 18.
- Experimental should be results on page 20, line 33.

Appropriate correction is required.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1 and 39 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

As methods, claims 1 and 39 offer abstract ideas (e.g. "experiment design", "experiment matrix", "matrix elements", "process conditions", "experimental results", "library of materials") that are also not embodied in the technological arts. Abstract ideas and their manipulation constitute "descriptive material" that is not patentable, *Warmerdam*, 33 F.3d at 1360, 31 USPQ2d at 1759 and *Schrader*, 22 F.3d at 292-93, 30 USPQ2d at 1457-58, respectively. If claims 1 and 39 were amended to recite a computer-implemented method, they will be statutory in most cases since use of technology permits the function of the descriptive material to be realized. For examples,

- *In re Lowry*, 32 F.3d 1579, 1583-84, 32 USPQ2d 1031, 1035 (Fed. Cir. 1994) offers claim to data structure stored on a computer readable medium that increases computer efficiency held statutory and
- *Warmerdam*, 33 F.3d at 1360-61, 31 USPQ2d at 1759 offers product-by-process claim to computer having a specific data structure stored in memory also held statutory while
- *Warmerdam*, 33 F.3d at 1361, 31 USPQ2d at 1760 offers claim to a data structure *per se* held nonstatutory.

Because the ideas are not claimed to be practiced on a computer and/or stored on a computer readable medium, they are not limited to practical applications in the technological arts. Specifically, the claims are methods without any particular practical

application, such as a program running on a computer and stored in a computer readable medium or memory. On that basis alone, those claims are clearly nonstatutory.

Claim Rejections - 35 USC § 102

To expedite a complete examination of the instant application, the claims rejected under 35 U.S.C. 101 (nonstatutory) above are further rejected as set forth below in anticipation of applicant amending these claims to place them within the four statutory categories of invention.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless -
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-3, 9-21, 24, 26-27, 29, 31-45 and 47-52 are rejected under 35 U.S.C. 102(e) as being anticipated by *Nova et al* U.S. Patent Number 6,329,139 (Issued December 11, 2001, Filed August 11, 1997).

Regarding claim 1:

Nova et al teaches,

- providing to a remote user at a first location a computer-implemented experiment design tool for generating an experiment design defining a set of experiments, the experiment design including an experiment matrix having a plurality of matrix elements, one or more starting materials assigned to the matrix elements and one or more process conditions to be applied to the matrix elements, each of a plurality of matrix elements being defined by a unique combination of starting materials and/or process conditions, the experiment design also defining a screening method to be applied to generate experimental results (Fig. 35; Abstract, "Automated drug discovery...matrices with memories"; column 2, lines 3-31, "The present invention...biological assay systems"; column 186, lines 33-43, "A portion of...experiments was 50%")
- receiving at a second location a first user input including a first experiment design generated by the experiment design tool, the second location being remote from the first location (column 5, lines 31-40, "By virtue of...with identifying information "; column 95, lines 38-48, "Manual sorting...the transferring procedure")
- preparing a library of materials corresponding to the experiment matrix, the library of materials having a plurality of members (column 2, lines 51-67, "The provision and ...J. Medicinal"; column 3, lines 1-37, "Chemistry 37:1233-12511... vitro assay systems")
- applying the process conditions to the members of the library of materials to transform at least one of the starting materials into a product (column 81, lines 43-60, "The structural changes... intermediate state")

- applying a first screening method defined by the first experiment design to generate experimental results (column 13, lines 47-67, "Containers, such as...particular protocol, whereby"; column 14, lines 1-5, "a sample may...of the sample")

- providing the experimental results to the remote user (column 143, lines 44-67, "Once rectified, the...the sample or"; column 144, lines 1-2, "specimen contained in...and identification number")

Regarding claim 2:

The rejection of claim 1 is incorporated. Therefore, claim 2 is rejected under the same rationale as claim 1.

Regarding claim 3:

The rejection of claim 2 is incorporated. Therefore, claim 3 is rejected under the same rationale as claim 2.

Regarding claim 9:

Nova et al teaches,

- in response to providing the experimental results, receiving a second user input including a second experiment design defining one or more additional experiments column 14, lines 6-13, "These instruments and...processed an assayed")

- preparing a second library of materials based on the second experiment design (column 14, lines 14-28, "A container is...bars are used")

- applying one or more process conditions specified in the second experiment design to the members of the second library of materials to transform at least one of the starting materials into a product and applying a second screening method to generate additional

experimental results (column 14, lines 29-35, "Methods for electromagnetically...into the memory")

- providing the additional experimental results to the remote user (column 14, lines 36-46, "The, thus identified...group are provided")

Regarding claim 10:

The rejection of claim 9 is incorporated. Therefore, claim 10 is rejected under the same rationale as claim 9.

Regarding claim 11:

Nova et al teaches,

- the second screening method and the first screening method are different (column 125, lines 16-64, "Anti-microbial assays and...different Salmonella strains")

Regarding claim 12:

Nova et al teaches,

- the computer-implemented experiment design tool includes an interactive user interface configured to enable the remote user to select materials from a list of materials in a remote material inventory (column 41, lines 11-41, "Matrices include any...syntheses or reactions"; column 172, lines 42-48, "Calibration files are...to the X-Y locations")

Regarding claim 13:

Nova et al teaches,

- the computer-implemented experiment design tool includes an interactive user interface configured to enable the user to select processing conditions from a list of

processing conditions that can be implemented by a remote process control system (column 171, lines 39-67, "Host controller 12701...of the sorter")

Regarding claim 14:

Nova et al teaches,

- the computer-implemented experiment design tool includes an interactive user interface configured to enable the user to select high throughput screening methods from a list of screening methods that can be performed by one or more screening instruments available at a remote laboratory location (column 158, lines 66-67, "Find Compound. The...13804 for "Find"; column 159, lines 1-19, "Compound." The software...manual sorting system")

Regarding claim 15:

Nova et al teaches,

- the computer-implemented experiment design tool includes an interactive user interface configured to access one or more databases of available materials, process conditions and high throughput screening methods (column 158, lines 47-52, "d. User affirms placement...a another library")

Regarding claim 16:

Nova et al teaches,

- the first screening method is automatically defined based on one or more of the starting materials and process conditions (column 127, lines 21-40, "Mixtures nucleic acid...the hybridizing probe"; column 128, lines 1-19, "Also of interest ... the methods herein"; column 129, lines 5-20, "each oligomer is...the gene segment")

Regarding claim 17:

Nova et al teaches,

- evaluating the first experiment design before preparing the library of materials to generate an experimental plan describing a proposed execution of the set of experiments (column 21, lines 18-63, "an improvement of...with each compound"; column 95, lines 66-67, "This manual system...MICROTUBE™, MICROBEAD™, or"; column 96, lines 1-9, "MICROBALL™ microreactors, read/write")

- providing the experimental plan to the remote user (column 21, lines 5-17, "Also provided are...as provided herein")

Regarding claim 18:

Nova et al teaches,

- evaluating the first experiment design includes generating an estimate of time and/or cost to perform the set of experiments defined by the first experiment design (column 120, lines 34-57, "A sample of...quantitated in duplicate"; column 45, lines 24-44, "Extrusion is one...the MICROTUBE microreactor")

Regarding claim 19:

Nova et al teaches,

- evaluating the first experiment design includes determining whether the design conforms to a set of experiment parameters, and, if not, communicating to the remote user that one or more experiments defined by the experiment design cannot be executed (column 6, lines 31-36, "In certain embodiments...in the memory"; column 95,

lines 66-67, "This manual system...MICROTUBE™, MICROBEAD™, or"; column 96, lines 1-9, "MICROBALL™ microreactors, read/write")

Regarding claim 20:

Nova et al teaches,

- determining whether the design conforms to the set of experiment parameters includes determining whether the assigned starting materials specified in the first experiment design are present in an inventory of materials (column 8, lines 33-53, "The data storage...one matrix particle")

Regarding claim 21:

Nova et al teaches,

- evaluating the first experiment design includes determining whether the assigned starting materials have chemical or physical properties falling within a predetermined set of chemical or physical properties (column 8, lines 33-53, "The data storage...one matrix particle")

Regarding claim 24:

Nova et al teaches,

- the first experiment design includes information identifying one or more custom materials assigned to one or more matrix elements (column 9, lines 5-22, "The recording device...may be identified")

- receiving the custom materials from the remote user for use in preparing the library of materials (column 13, lines 47-67, "Containers, such as...particular protocol, whereby"; column 14, lines 1-5, "a sample may...of the sample")

Regarding claim 26:

The rejection of claim 1 is incorporated. Therefore, claim 26 is rejected under the same rationale as claim 1.

Regarding claim 27:

Nova et al teaches,

- the set of experiments is directed to the preparation of pharmaceutical products or intermediates (column 36, lines 38-41, "As used herein...enzymes and cofactors"; column 37, lines 21-29, "As used herein...esterified or etherified")

Regarding claim 29:

Nova et al teaches,

- the set of experiments is directed to the preparation of specialty chemicals (column 114, lines 61-67, "These plates are...established protocols avail-"; column 115, lines 1-29, "able for the...agents are known")

Regarding claim 31:

Nova et al teaches,

- the first experiment design defines a set of experiments directed to polymerization (column 14, lines 47-67, "Methods for tagging...example dipping the"; column 15, lines 1-3, "memory into the...of the memory")

Regarding claim 32:

The rejection of claim 31 is incorporated. Therefore, claim 32 is rejected under the same rationale as claim 31.

Regarding claim 33:

Nova et al teaches,

- the first experiment design defines a set of experiments directed to the preparation of electronic materials (column 57, lines 1-23, "If needed, segregation...from its environment")

Regarding claim 34:

Nova et al teaches,

- the experiment design defines a set of experiments directed to the preparation of composites or alloys (column 15, lines 37-46, "Compositions containing combinations ... memories are provided")

Regarding claim 35:

Nova et al teaches,

- the user receives the experimental results by accessing a results database through a remote computer-implemented interactive user interface (column 5, lines 31-40, "By virtue of...with identifying information "; column 95, lines 38-48, "Manual sorting...the transferring procedure"; column 158, lines 47-52, "d. User affirms placement...a another library")

Regarding claim 36:

Nova et al teaches,

- in response to providing the experimental results, receiving a second user input from the remote user including a request to purchase a starting material or product corresponding to one of the elements of the experiment matrix (column 106, lines 66-

67, "Matrices with memories...a memory [or"; column 107, lines 1-58, "engraved or imprinted...matrices with memories")

Regarding claim 37:

Nova et al teaches,

- the experiment design tool is provided as a computer program to be executed by a computer system at the first location (column 19, lines 54-67, "a manual sorter ... encodable, writing to"; column 20, lines 1-3, "the memories, a...sorter is provided")

Regarding claim 38:

Nova et al teaches,

- the experiment design tool is provided as a computer program executed by a server process running at the second location (column 172, lines 1-10, "Sorter server 12706...within an application")

- the remote user access the experiment design tool using a client process running at the first location (column 172, lines 49-55, "the Simulator Utility...look up time")

Regarding claim 39:

Nova et al teaches,

- generating at a first location an experiment design defining a set of experiments, the experiment design including an experiment matrix having a plurality of elements, one or more starting materials assigned to the matrix elements, and one or more process conditions to be applied to the matrix elements, each of a plurality of matrix elements being defined by a unique combination of starting materials and/or process conditions, the experiment design also defining a screening method to be applied to generate

experimental results (Fig. 35; Abstract, "Automated drug discovery...matrices with memories"; column 2, lines 3-31, "The present invention...biological assay systems"; column 186, lines 33-43, "A portion of...experiments was 50%")

- communicating the experiment design to a laboratory at a second location for execution, the second location being remote from the first location (column 13, lines 47-67, "Containers, such as...particular protocol, whereby"; column 14, lines 1-5, "a sample may...of the sample")

- receiving at the first location an experimental plan describing a proposed execution of the set of experiments (column 96, lines 32-53, "the user may...with memory devices")

- if the proposed execution of the set of experiments is acceptable, communicating an approval of the experimental plan to the laboratory (column 95, lines 66-67, "This manual system...MICROTUBE™, MICROBEAD™, or"; column 96, lines 1-9, "MICROBALL™ microreactors, read/write")

- receiving at the first location experimental results obtained at the laboratory by applying the process conditions to a library of materials corresponding to the experiment matrix to transform at least one of the starting materials into a product and applying the specified screening method (column 2, lines 51-67, "The provision and ...J. Medicinal"; column 3, lines 1-37, "Chemistry 37:1233-12511... vitro assay systems"; column 81, lines 43-60, "The structural changes... intermediate state"; column 13, lines 47-67, "Containers, such as...particular protocol, whereby"; column 14, lines 1-5, "a sample may...of the sample"; column 143, lines 44-67, "Once rectified, the...the sample or"; column 144, lines 1-2, "specimen contained in...and identification number")

Regarding claim 40:

Nova et al teaches,

- the experimental plan includes an estimate of time and/or cost to perform the set of experiments (column 120, lines 34-57, "A sample of...quantitated in duplicate"; column 45, lines 24-44, "Extrusion is one...the MICROTUBE microreactor")

Regarding claim 41:

Nova et al teaches,

- defining an experiment matrix having a plurality of matrix elements corresponding to locations in a library of materials (Fig. 35; Abstract, "Automated drug discovery ... matrices with memories"; column 2, lines 3-31, "The present invention ... biological assay systems"; column 186, lines 33-43, "A portion of...experiments was 50%")

- designating one or more starting materials and assigning each starting material to one or more matrix elements, and designating at least one processing condition to be applied to one or more elements of the experiment matrix, such that each of a plurality of matrix elements is defined by a unique combination of starting materials and/or process conditions (column 128, lines 1-19, "Also of interest ... the methods herein")

- designating a screening method to be applied to one or more elements of the experiment matrix (column 2, lines 51-67, "The provision and ...J. Medicinal"; column 3, lines 1-37, "Chemistry 37:1233-12511... vitro assay systems"; column 81, lines 43-60, "The structural changes... intermediate state"; column 13, lines 47-67, "Containers, such as...particular protocol, whereby"; column 14, lines 1-5, "a sample may...of the

sample"; column 143, lines 44-67, "Once rectified, the...the sample or"; column 144, lines 1-2, "specimen contained in...and identification number")

- communicating an experiment design to the remote laboratory, the experiment design including the experiment matrix and the screening method designation (column 13, lines 47-67, "Containers, such as...particular protocol, whereby"; column 14, lines 1-5, "a sample may...of the sample")

Regarding claim 42:

Nova et al teaches,

- the starting materials are selected from a list of materials in a remote material inventory (column 41, lines 11-41, "Matrices include any...syntheses or reactions"; column 172, lines 42-48, "Calibration files are...to the X-Y locations")

Regarding claim 43:

Nova et al teaches,

- the processing conditions are selected from a list of processing conditions that can be implemented by a remote process control system (column 171, lines 39-67, "Host controller 12701...of the sorter")

Regarding claim 44:

Nova et al teaches,

- the screening method is selected from a list of screening methods that can be performed by one or more remote screening instruments (column 158, lines 66-67, "Find Compound. The...13804 for "Find"; column 159, lines 1-19, "Compound." The software...manual sorting system")

Regarding claim 45:

Nova et al teaches,

- the experimental plan includes an estimate of time and/or cost to perform the set of experiments (column 120, lines 34-57, "A sample of...quantitated in duplicate"; column 45, lines 24-44, "Extrusion is one...the MICROTUBE microreactor")

Regarding claim 47:

Nova et al teaches,

- a computer-implemented remote experiment design tool for generating an experiment design defining a set of experiments, the experiment design including an experiment matrix having a plurality of matrix elements, one or more starting materials assigned to the matrix elements and one or more process conditions to be applied to the matrix elements, each of a plurality of matrix elements being defined by a unique combination of starting materials and/or process conditions, the experiment design also defining a screening method to be applied to generate experimental results (Fig. 35; Abstract, "Automated drug discovery ... matrices with memories"; column 2, lines 3-31, "The present invention ... biological assay systems"; column 186, lines 33-43, "A portion of...experiments was 50%")

- a user interface subsystem configured to receive an experiment design generated by the experiment design tool and to provide experimental results to a user (column 95, lines 38-48, "Manual sorting...the transferring procedure")

- a research engine configured to evaluate the experiment design, generate an experimental plan describing a proposed execution of the set of experiments, and

prepare a library of materials corresponding to the experiment matrix according to the experimental plan, the library of materials having a plurality of members, each member containing the starting materials assigned to a corresponding matrix element, the research engine being operable to apply the process conditions to the members of the library of materials to transform at least one of the starting materials into a product and to apply the screening method to generate experimental results (column 125, lines 30-52, "The AMES test...corresponding control plates")

Regarding claim 48:

Nova et al teaches,

- an inventory subsystem including an inventory database storing information identifying a plurality of materials in a material inventory (column 158, lines 47-52, "d. User affirms placement...a another library")

Regarding claim 49:

Nova et al teaches,

- one or more automated instruments coupled to the research engine (column 92, lines 58-65, "A completely automated... microreactor carrier tray")

- wherein the research engine includes a process database storing information identifying a plurality of chemical processes capable of being performed by the one or more automated instruments (column 157, lines 53-58, "3. Perform Synthesis. Using...OR MICRO-TUBE™ microreactor")

Regarding claim 50:

Nova et al teaches,

- the research engine includes an experiment database storing information about one or more sets of experiments executed on behalf of the remote user (column 143, lines 44-67, "Once rectified, the ...the sample or"; column 144, lines 1-2, "specimen contained in...and identification number")

Regarding claim 51:

Nova et al teaches,

- provide to a remote user at a first location a computer-implemented experiment design tool for generating an experiment design defining a set of experiments, the experiment design including an experiment matrix having a plurality of matrix elements, one or more starting materials assigned to the matrix elements and one or more process conditions to be applied to the matrix elements, each of a plurality of matrix elements being defined by a unique combination of starting materials and/or process conditions, the experiment design also defining a screening method to be applied to generate experimental results (Fig. 35; Abstract, "Automated drug discovery...matrices with memories"; column 2, lines 3-31, "The present invention...biological assay systems"; column 186, lines 33-43, "A portion of...experiments was 50%")

- receive at a second location a first user input including an experiment design generated by the experiment design tool, the second location being remote from the first location (column 5, lines 31-40, "By virtue of...with identifying information "; column 95, lines 38-48, "Manual sorting...the transferring procedure")

- direct an automated synthesis instrument to prepare a library of materials corresponding to the experiment matrix, the library of materials having a plurality of members (column 92, lines 58-65, "A completely automated... microreactor carrier tray")

- direct an automated instrument to apply the process conditions to the members of the library of materials to transform at least one of the starting materials into a product (column 92, lines 65-67, "The microreactor carrier...to each microre-"; column 93, lines 1-3, "actor carrier within...onto a shaker")

- direct an automated screening instrument to apply a first screening method defined by the first experiment design to generate experimental results (column 93, lines 3-9, "Alternatively, a shaker...compound is known")

- provide the experimental results to the remote user (column 143, lines 44-67, "Once rectified, the...the sample or"; column 144, lines 1-2, "specimen contained in...and identification number")

Regarding claim 52:

Nova et al teaches,

- receive an input defining an experiment matrix having a plurality of matrix elements corresponding to locations in a library of materials (Fig. 35; Abstract, "Automated drug discovery...matrices with memories"; column 2, lines 3-31, "The present invention...biological assay systems"; column 186, lines 33-43, "A portion of...experiments was 50%"; column 5, lines 31-40, "By virtue of...with identifying information "; column 95, lines 38-48, "Manual sorting...the transferring procedure")

- receive an input designating one or more starting materials and assigning each starting material to one or more matrix elements, and designating at least one processing condition to be applied to one or more elements of the experiment matrix, such that each of a plurality of matrix elements is defined by a unique combination of starting materials and/or process conditions (column 128, lines 1-19, "Also of interest ... the methods herein")

- receive an input designating a screening method to be applied to one or more elements of the experiment matrix (column 13, lines 47-67, "Containers, such as...particular protocol, whereby"; column 14, lines 1-5, "a sample may...of the sample")

- communicate an experiment design to the remote laboratory, the experiment design including the experiment matrix and the screening method designation (column 13, lines 47-67, "Containers, such as...particular protocol, whereby"; column 14, lines 1-5, "a sample may...of the sample")

Claim Rejections - 35 USC § 103

To expedite a complete examination of the instant application, the claims rejected under 35 U.S.C. 101 (nonstatutory) above are further rejected as set forth below in anticipation of applicant amending these claims to place them within the four statutory categories of invention.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the Office presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the Office to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claim 4-8, 22-23, 25, 28, 30 and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Nova et al* U.S. Patent Number 6,329,139 (Issued December 11, 2001, Filed August 11, 1997) in view of

- *Chen et al* U.S. Patent Number 5,569,799 (October 29, 1996) in further view of,
- *Allen et al* U.S. Patent Number 5,969,121 (October 19, 1999) in further view of,
- *Falb* U.S. Patent Number 5,849,578 (December 15, 1998) in further view of,
- *Li* U.S. Patent Number 4,710,864 (December 1, 1987) and in further view of,

Lennon et al "Using a Distributed Mini-Computer Network to Automate a Biochemical Laboratory" (March 1976).

Regarding claim 4:

Nova et al teaches 1) a remote user, 2) a computer-implemented experiment design tool provided as a computer program executed by a client-server computer system, 3) defining a set of experiments, 4) an experiment matrix having a plurality of matrix elements, 5) starting materials, process conditions, and different high throughput screening methods applied to generate experimental results, 6) libraries of materials having a plurality of members, 7) transforming starting materials into a product, 8) providing experimental results to the remote user, 9) user input via an interactive user interface enabling selection from lists of materials, processing conditions and high throughput screening methods using a remote material inventory implemented by a remote process control system and one or more screening instruments at a remote laboratory location, 10) databases of materials, processing conditions and high throughput screening methods, experiments and results, 11) automatic definition of screening methods, 12) a research engine coupled to automated instruments configured to evaluate experiment designs before generating experimental plans and capable of performing chemical processes, 13) generating an estimate of experiment time defined by the experiment design, 14) experiment parameters, 15) starting materials with predetermined chemical or physical properties, 16) custom materials assigned to matrix elements used in preparing the library of materials, 17) preparation of pharmaceutical products, intermediates, specialty chemicals, electronic materials, composites, 18) experiments directed to polymerization 19) starting material or product purchase requests, 20) communicating the experiment design and approved or

unacceptable experimental plan to a remote laboratory 21) a time to perform the set of experiments estimate, 22) an inventory subsystem including an inventory database and 23) automated synthesis and screening instruments. However, *Nova et al* doesn't explicitly teach an experiment matrix of at least 50 elements while *Li* teaches,

- the experiment matrix includes at least 50 elements (Abstract, "The invention relates...is also disclosed"; column 3, lines 13-48, "This large number...tests were made")

- a variable amount of time before experimental results are available (column 6, lines 34-68, "The furnace is...a fixed number"; column 7, lines 1-25, "m of variables...always maintained optimal")

Falb teaches,

- the experimental results are provided to the user within 20 days from preparation of the first library (column 80, lines 26-62, "Hybridizations were performed...cells and macrophages")

Motivation - The portions of the claimed method would have been highly desirable features in this art for

- Comprehensive discovery and evaluation of novel genes and gene products (*Falb*, column 6, lines 38-64, "The invention is...the known genes")
- Instant optimization status (*Li*, column 5, lines 50-56, "A further object...retesting and reoptimizing")
- Efficient removal of undesirable material (*Nova et al*, column 190, lines 3-20, "the optimal wash...about 2 days")

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to combine *Nova et al* with *Li* and *Falb* to obtain the invention specified in claim 4, a research method performed for carrying out a set of experiments. The modification would have been obvious because one of ordinary skill in the art would have been motivated to efficiently optimize the discovery of novel products.

Regarding claim 5:

Nova et al teaches 1) a remote user, 2) a computer-implemented experiment design tool provided as a computer program executed by a client-server computer system, 3) defining a set of experiments, 4) an experiment matrix having a plurality of matrix elements, 5) starting materials, process conditions, and different high throughput screening methods applied to generate experimental results, 6) libraries of materials having a plurality of members, 7) transforming starting materials into a product, 8) providing experimental results to the remote user, 9) user input via an interactive user interface enabling selection from lists of materials, processing conditions and high throughput screening methods using a remote material inventory implemented by a remote process control system and one or more screening instruments at a remote laboratory location, 10) databases of materials, processing conditions and high throughput screening methods, experiments and results, 11) automatic definition of screening methods, 12) a research engine coupled to automated instruments configured to evaluate experiment designs before generating experimental plans and capable of performing chemical processes, 13) generating an estimate of experiment time defined by the experiment design, 14) experiment parameters, 15) starting

materials with predetermined chemical or physical properties, 16) custom materials assigned to matrix elements used in preparing the library of materials, 17) preparation of pharmaceutical products, intermediates, specialty chemicals, electronic materials, composites, 18) experiments directed to polymerization 19) starting material or product purchase requests, 20) communicating the experiment design and approved or unacceptable experimental plan to a remote laboratory 21) a time to perform the set of experiments estimate, 22) an inventory subsystem including an inventory database and 23) automated synthesis and screening instruments. However, *Nova et al* doesn't explicitly teach an experiment matrix of at least 96 elements while *Li* teaches,

- the experiment matrix includes at least 96 elements (Abstract, "The invention relates...is also disclosed"; column 3, lines 13-48, "This large number...tests were made")

- a variable amount of time before experimental results are available (column 6, lines 34-68, "The furnace is...a fixed number"; column 7, lines 1-25, "m of variables...always maintained optimal")

Falb teaches,

- the experimental results are provided to the user within 10 days from preparation of the first library (column 80, lines 26-62, "Hybridizations were performed...cells and macrophages")

Motivation - The portions of the claimed method would have been highly desirable features in this art for

- Comprehensive discovery and evaluation of novel genes and gene products (*Falb*, column 6, lines 38-64, "The invention is...the known genes")
- Instant optimization status (*Li*, column 5, lines 50-56, "A further object...retesting and reoptimizing")
- Efficient removal of undesirable material (*Nova et al*, column 190, lines 3-20, "the optimal wash...about 2 days")

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to combine *Nova et al* with *Li* and *Falb* to obtain the invention specified in claim 5, a research method performed for carrying out a set of experiments. The modification would have been obvious because one of ordinary skill in the art would have been motivated to efficiently optimize the discovery of novel products.

Regarding claim 6:

Nova et al teaches 1) a remote user, 2) a computer-implemented experiment design tool provided as a computer program executed by a client-server computer system, 3) defining a set of experiments, 4) an experiment matrix having a plurality of matrix elements, 5) starting materials, process conditions, and different high throughput screening methods applied to generate experimental results, 6) libraries of materials having a plurality of members, 7) transforming starting materials into a product, 8) providing experimental results to the remote user, 9) user input via an interactive user interface enabling selection from lists of materials, processing conditions and high throughput screening methods using a remote material inventory implemented by a remote process control system and one or more screening instruments at a remote

laboratory location, 10) databases of materials, processing conditions and high throughput screening methods, experiments and results, 11) automatic definition of screening methods, 12) a research engine coupled to automated instruments configured to evaluate experiment designs before generating experimental plans and capable of performing chemical processes, 13) generating an estimate of experiment time defined by the experiment design, 14) experiment parameters, 15) starting materials with predetermined chemical or physical properties, 16) custom materials assigned to matrix elements used in preparing the library of materials, 17) preparation of pharmaceutical products, intermediates, specialty chemicals, electronic materials, composites, 18) experiments directed to polymerization 19) starting material or product purchase requests, 20) communicating the experiment design and approved or unacceptable experimental plan to a remote laboratory 21) a time to perform the set of experiments estimate, 22) an inventory subsystem including an inventory database and 23) automated synthesis and screening instruments. However, *Nova et al* doesn't explicitly teach an experiment matrix of at least 1000 elements while *Li* teaches,

- the experiment matrix includes at least 96 elements (Abstract, "The invention relates...is also disclosed"; column 3, lines 13-48, "This large number...tests were made")

- a variable amount of time before experimental results are available (column 6, lines 34-68, "The furnace is...a fixed number"; column 7, lines 1-25, "m of variables...always maintained optimal")

Falb teaches,

- the experimental results are provided to the user within 50 days from preparation of the first library (column 80, lines 26-62, "Hybridizations were performed...cells and macrophages")

Motivation - The portions of the claimed method would have been highly desirable features in this art for

- Comprehensive discovery and evaluation of novel genes and gene products (*Falb*, column 6, lines 38-64, "The invention is...the known genes")
- Instant optimization status (*Li*, column 5, lines 50-56, "A further object...retesting and reoptimizing")
- Efficient removal of undesirable material (*Nova et al*, column 190, lines 3-20, "the optimal wash...about 2 days")

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to combine *Nova et al* with *Li* and *Falb* to obtain the invention specified in claim 6, a research method performed for carrying out a set of experiments. The modification would have been obvious because one of ordinary skill in the art would have been motivated to efficiently optimize the discovery of novel products.

Regarding claim 7:

Nova et al teaches 1) a remote user, 2) a computer-implemented experiment design tool provided as a computer program executed by a client-server computer system, 3) defining a set of experiments, 4) an experiment matrix having a plurality of matrix elements, 5) starting materials, process conditions, and different high throughput screening methods applied to generate experimental results, 6) libraries of materials

having a plurality of members, 7) transforming starting materials into a product, 8) providing experimental results to the remote user, 9) user input via an interactive user interface enabling selection from lists of materials, processing conditions and high throughput screening methods using a remote material inventory implemented by a remote process control system and one or more screening instruments at a remote laboratory location, 10) databases of materials, processing conditions and high throughput screening methods, experiments and results, 11) automatic definition of screening methods, 12) a research engine coupled to automated instruments configured to evaluate experiment designs before generating experimental plans and capable of performing chemical processes, 13) generating an estimate of experiment time defined by the experiment design, 14) experiment parameters, 15) starting materials with predetermined chemical or physical properties, 16) custom materials assigned to matrix elements used in preparing the library of materials, 17) preparation of pharmaceutical products, intermediates, specialty chemicals, electronic materials, composites, 18) experiments directed to polymerization 19) starting material or product purchase requests, 20) communicating the experiment design and approved or unacceptable experimental plan to a remote laboratory 21) a time to perform the set of experiments estimate, 22) an inventory subsystem including an inventory database and 23) automated synthesis and screening instruments. However, *Nova et al* doesn't explicitly teach an experiment matrix of at least 1000 elements while *Li* teaches,

- the experiment matrix includes more than 127 elements (Abstract, "The invention relates...is also disclosed"; column 3, lines 13-48, "This large number...tests were made")

- a variable amount of time before experimental results are available (column 6, lines 34-68, "The furnace is...a fixed number"; column 7, lines 1-25, "m of variables...always maintained optimal")

Falb teaches,

- the experimental results are provided to the user within 20 days from preparation of the first library (column 80, lines 26-62, "Hybridizations were performed...cells and macrophages")

Motivation - The portions of the claimed method would have been highly desirable features in this art for

- Comprehensive discovery and evaluation of novel genes and gene products (*Falb*, column 6, lines 38-64, "The invention is...the known genes")
- Instant optimization status (*Li*, column 5, lines 50-56, "A further object...retesting and reoptimizing")
- Efficient removal of undesirable material (*Nova et al*, column 190, lines 3-20, "the optimal wash...about 2 days")

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to combine *Nova et al* with *Li* and *Falb* to obtain the invention specified in claim 7, a research method performed for carrying out a set of experiments.

The modification would have been obvious because one of ordinary skill in the art would have been motivated to efficiently optimize the discovery of novel products.

Regarding claim 8:

Nova et al teaches 1) a remote user, 2) a computer-implemented experiment design tool provided as a computer program executed by a client-server computer system, 3) defining a set of experiments, 4) an experiment matrix having a plurality of matrix elements, 5) starting materials, process conditions, and different high throughput screening methods applied to generate experimental results, 6) libraries of materials having a plurality of members, 7) transforming starting materials into a product, 8) providing experimental results to the remote user, 9) user input via an interactive user interface enabling selection from lists of materials, processing conditions and high throughput screening methods using a remote material inventory implemented by a remote process control system and one or more screening instruments at a remote laboratory location, 10) databases of materials, processing conditions and high throughput screening methods, experiments and results, 11) automatic definition of screening methods, 12) a research engine coupled to automated instruments configured to evaluate experiment designs before generating experimental plans and capable of performing chemical processes, 13) generating an estimate of experiment time defined by the experiment design, 14) experiment parameters, 15) starting materials with predetermined chemical or physical properties, 16) custom materials assigned to matrix elements used in preparing the library of materials, 17) preparation of pharmaceutical products, intermediates, specialty chemicals, electronic materials,

composites, 18) experiments directed to polymerization 19) starting material or product purchase requests, 20) communicating the experiment design and approved or unacceptable experimental plan to a remote laboratory 21) a time to perform the set of experiments estimate, 22) an inventory subsystem including an inventory database and 23) automated synthesis and screening instruments. However, *Nova et al* doesn't explicitly teach an experiment matrix of at least 1000 elements while *Li* teaches,

- the experiment matrix includes more than 127 elements (Abstract, "The invention relates...is also disclosed"; column 3, lines 13-48, "This large number...tests were made")

- a variable amount of time before experimental results are available (column 6, lines 34-68, "The furnace is...a fixed number"; column 7, lines 1-25, "m of variables...always maintained optimal")

Falb teaches,

- the experimental results are provided to the user within 10 days from preparation of the first library (column 80, lines 26-62, "Hybridizations were performed...cells and macrophages")

Motivation - The portions of the claimed method would have been highly desirable features in this art for

- Comprehensive discovery and evaluation of novel genes and gene products (*Falb*, column 6, lines 38-64, "The invention is...the known genes")
- Instant optimization status (*Li*, column 5, lines 50-56, "A further object...retesting and reoptimizing")

- Efficient removal of undesirable material (*Nova et al*, column 190, lines 3-20, "the optimal wash... about 2 days")

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to combine *Nova et al* with *Li* and *Falb* to obtain the invention specified in claim 8, a research method performed for carrying out a set of experiments. The modification would have been obvious because one of ordinary skill in the art would have been motivated to efficiently optimize the discovery of novel products.

Regarding claim 22:

Nova et al teaches 1) a remote user, 2) a computer-implemented experiment design tool provided as a computer program executed by a client-server computer system, 3) defining a set of experiments, 4) an experiment matrix having a plurality of matrix elements, 5) starting materials, process conditions, and different high throughput screening methods applied to generate experimental results, 6) libraries of materials having a plurality of members, 7) transforming starting materials into a product, 8) providing experimental results to the remote user, 9) user input via an interactive user interface enabling selection from lists of materials, processing conditions and high throughput screening methods using a remote material inventory implemented by a remote process control system and one or more screening instruments at a remote laboratory location, 10) databases of materials, processing conditions and high throughput screening methods, experiments and results, 11) automatic definition of screening methods, 12) a research engine coupled to automated instruments configured to evaluate experiment designs before generating experimental plans and

capable of performing chemical processes, 13) generating an estimate of experiment time defined by the experiment design, 14) experiment parameters, 15) starting materials with predetermined chemical or physical properties, 16) custom materials assigned to matrix elements used in preparing the library of materials, 17) preparation of pharmaceutical products, intermediates, specialty chemicals, electronic materials, composites, 18) experiments directed to polymerization 19) starting material or product purchase requests, 20) communicating the experiment design and approved or unacceptable experimental plan to a remote laboratory 21) a time to perform the set of experiments estimate, 22) an inventory subsystem including an inventory database and 23) automated synthesis and screening instruments. However, *Nova et al* doesn't explicitly teach experiment execution requests submitted over a network while *Lennon et al* teaches,

- the computer-implemented experiment design tool is configured to enable the remote user to generate an experiment request for execution of the set of experiments defined by the first experiment design for submission over a computer network (page 159, 'THE LABORATORY CONTROL SYSTEM' section, paragraphs 1-2, "The realization of...approach highly effective"; page 160, paragraphs 1-3, "A sequential process...a data-base manager")

Motivation - The portions of the claimed method would have been highly desirable features in this art for

- Effective instrument scheduling and accurate record keeping (*Lennon et al*, page 156, 'BACKGROUND' section, "The determination of...of these procedures")

- Efficient removal of undesirable material (*Nova et al*, column 190, lines 3-20, "the optimal wash...about 2 days")

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to combine *Nova et al* with *Lennon et al* to obtain the invention specified in claim 22, a research method performed for carrying out a set of experiments. The modification would have been obvious because one of ordinary skill in the art would have been motivated to efficiently schedule the set of experiments.

Regarding claim 23:

The rejection of claim 22 is incorporated. Claim 23's further limitations are taught in *Lennon et al:*

- the first experiment design is received from the remote user over a computer network (page 160, 'NETWORK COMMUNICATION SOFTWARE' section, paragraphs 1-3, "We have three...general interprocess communications")

Therefore, claim 23 is rejected under the same rationale as claim 22.

Regarding claim 25:

Nova et al teaches 1) a remote user, 2) a computer-implemented experiment design tool provided as a computer program executed by a client-server computer system, 3) defining a set of experiments, 4) an experiment matrix having a plurality of matrix elements, 5) starting materials, process conditions, and different high throughput screening methods applied to generate experimental results, 6) libraries of materials having a plurality of members, 7) transforming starting materials into a product, 8) providing experimental results to the remote user, 9) user input via an interactive user

interface enabling selection from lists of materials, processing conditions and high throughput screening methods using a remote material inventory implemented by a remote process control system and one or more screening instruments at a remote laboratory location, 10) databases of materials, processing conditions and high throughput screening methods, experiments and results, 11) automatic definition of screening methods, 12) a research engine coupled to automated instruments configured to evaluate experiment designs before generating experimental plans and capable of performing chemical processes, 13) generating an estimate of experiment time defined by the experiment design, 14) experiment parameters, 15) starting materials with predetermined chemical or physical properties, 16) custom materials assigned to matrix elements used in preparing the library of materials, 17) preparation of pharmaceutical products, intermediates, specialty chemicals, electronic materials, composites, 18) experiments directed to polymerization 19) starting material or product purchase requests, 20) communicating the experiment design and approved or unacceptable experimental plan to a remote laboratory 21) a time to perform the set of experiments estimate, 22) an inventory subsystem including an inventory database and 23) automated synthesis and screening instruments. However, *Nova et al* doesn't explicitly teach chemicatalysis or biocatalysis while *Allen et al* teaches,

- the first experiment design defines a set of experiments directed to chemicatalysis or biocatalysis (column 10, lines 4-13, "The instant invention...isolated enzyme preparations")

Motivation - The portions of the claimed method would have been highly desirable features in this art for

- Added stability and functionality (*Allen et al*, column 10, lines 14-31, "The results of...slightly below neutral")
- Efficient removal of undesirable material (*Nova et al*, column 190, lines 3-20, "the optimal wash...about 2 days")

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to combine *Nova et al* with *Allen et al* to obtain the invention specified in claim 25, a research method performed for carrying out a set of experiments. The modification would have been obvious because one of ordinary skill in the art would have been motivated to efficiently stabilize experiments.

Regarding claim 28:

Nova et al teaches 1) a remote user, 2) a computer-implemented experiment design tool provided as a computer program executed by a client-server computer system, 3) defining a set of experiments, 4) an experiment matrix having a plurality of matrix elements, 5) starting materials, process conditions, and different high throughput screening methods applied to generate experimental results, 6) libraries of materials having a plurality of members, 7) transforming starting materials into a product, 8) providing experimental results to the remote user, 9) user input via an interactive user interface enabling selection from lists of materials, processing conditions and high throughput screening methods using a remote material inventory implemented by a remote process control system and one or more screening instruments at a remote

laboratory location, 10) databases of materials, processing conditions and high throughput screening methods, experiments and results, 11) automatic definition of screening methods, 12) a research engine coupled to automated instruments configured to evaluate experiment designs before generating experimental plans and capable of performing chemical processes, 13) generating an estimate of experiment time defined by the experiment design, 14) experiment parameters, 15) starting materials with predetermined chemical or physical properties, 16) custom materials assigned to matrix elements used in preparing the library of materials, 17) preparation of pharmaceutical products, intermediates, specialty chemicals, electronic materials, composites, 18) experiments directed to polymerization 19) starting material or product purchase requests, 20) communicating the experiment design and approved or unacceptable experimental plan to a remote laboratory 21) a time to perform the set of experiments estimate, 22) an inventory subsystem including an inventory database and 23) automated synthesis and screening instruments. However, *Nova et al* doesn't explicitly teach the preparation of fine chemicals while *Allen et al* teaches,

- the set of experiments is directed to the preparation of fine chemicals (column 4, lines 57-67, "the instant disclosure...fits the structural"; column 5, lines 1-7, "parameters of the...limited in solvent")

Motivation - The portions of the claimed method would have been highly desirable features in this art for

- Added stability and functionality (*Allen et al*, column 10, lines 14-31, "The results of...slightly below neutral")

- Efficient removal of undesirable material (*Nova et al*, column 190, lines 3-20, "the optimal wash...about 2 days")

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to combine *Nova et al* with *Allen et al* to obtain the invention specified in claim 28, a research method performed for carrying out a set of experiments. The modification would have been obvious because one of ordinary skill in the art would have been motivated to efficiently stabilize experiments.

Regarding claim 30:

Nova et al teaches 1) a remote user, 2) a computer-implemented experiment design tool provided as a computer program executed by a client-server computer system, 3) defining a set of experiments, 4) an experiment matrix having a plurality of matrix elements, 5) starting materials, process conditions, and different high throughput screening methods applied to generate experimental results, 6) libraries of materials having a plurality of members, 7) transforming starting materials into a product, 8) providing experimental results to the remote user, 9) user input via an interactive user interface enabling selection from lists of materials, processing conditions and high throughput screening methods using a remote material inventory implemented by a remote process control system and one or more screening instruments at a remote laboratory location, 10) databases of materials, processing conditions and high throughput screening methods, experiments and results, 11) automatic definition of screening methods, 12) a research engine coupled to automated instruments configured to evaluate experiment designs before generating experimental plans and

capable of performing chemical processes, 13) generating an estimate of experiment time defined by the experiment design, 14) experiment parameters, 15) starting materials with predetermined chemical or physical properties, 16) custom materials assigned to matrix elements used in preparing the library of materials, 17) preparation of pharmaceutical products, intermediates, specialty chemicals, electronic materials, composites, 18) experiments directed to polymerization 19) starting material or product purchase requests, 20) communicating the experiment design and approved or unacceptable experimental plan to a remote laboratory 21) a time to perform the set of experiments estimate, 22) an inventory subsystem including an inventory database and 23) automated synthesis and screening instruments. However, *Nova et al* doesn't explicitly teach the preparation of commodity chemicals while *Chen et al* teaches,

- the set of experiments is directed to the preparation of commodity chemicals (column 1, lines 43-58, "Chloroethene, known as...ethylene as feedstock")

Motivation - The portions of the claimed method would have been highly desirable features in this art for

- Recovery of process materials (*Chen et al*, column 3, lines 28-43, "This new process...make-up chlorine source")
- Efficient removal of undesirable material (*Nova et al*, column 190, lines 3-20, "the optimal wash...about 2 days")

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to combine *Nova et al* with *Chen et al* to obtain the invention specified in claim 30, a research method performed for carrying out a set of

experiments. The modification would have been obvious because one of ordinary skill in the art would have been motivated to efficiently stabilize experiments.

Regarding claim 46:

Nova et al teaches 1) a remote user, 2) a computer-implemented experiment design tool provided as a computer program executed by a client-server computer system, 3) defining a set of experiments, 4) an experiment matrix having a plurality of matrix elements, 5) starting materials, process conditions, and different high throughput screening methods applied to generate experimental results, 6) libraries of materials having a plurality of members, 7) transforming starting materials into a product, 8) providing experimental results to the remote user, 9) user input via an interactive user interface enabling selection from lists of materials, processing conditions and high throughput screening methods using a remote material inventory implemented by a remote process control system and one or more screening instruments at a remote laboratory location, 10) databases of materials, processing conditions and high throughput screening methods, experiments and results, 11) automatic definition of screening methods, 12) a research engine coupled to automated instruments configured to evaluate experiment designs before generating experimental plans and capable of performing chemical processes, 13) generating an estimate of experiment time defined by the experiment design, 14) experiment parameters, 15) starting materials with predetermined chemical or physical properties, 16) custom materials assigned to matrix elements used in preparing the library of materials, 17) preparation of pharmaceutical products, intermediates, specialty chemicals, electronic materials,

composites, 18) experiments directed to polymerization 19) starting material or product purchase requests, 20) communicating the experiment design and approved or unacceptable experimental plan to a remote laboratory 21) a time to perform the set of experiments estimate, 22) an inventory subsystem including an inventory database and 23) automated synthesis and screening instruments. However, *Nova et al* doesn't explicitly teach experiment execution requests submitted over a network while *Lennon et al* teaches,

- the experiment design tool is communicated to the remote laboratory over a computer network (page 160, 'NETWORK COMMUNICATION SOFTWARE' section, paragraphs 1-3, "We have three...general interprocess communications")

Motivation - The portions of the claimed method would have been highly desirable features in this art for

- Effective instrument scheduling and accurate record keeping (*Lennon et al*, page 156, 'BACKGROUND' section, "The determination of...of these procedures")
- Efficient removal of undesirable material (*Nova et al*, column 190, lines 3-20, "the optimal wash...about 2 days")

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to combine *Nova et al* with *Lennon et al* to obtain the invention specified in claim 46, a computer-implemented method for designing a set of experiments for execution by a remote laboratory. The modification would have been obvious because one of ordinary skill in the art would have been motivated to efficiently schedule the set of experiments.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- *Nova et al*; U.S. Patent Numbers 6,329,139; 6,284,459; 5,961,923; 6,017,496
    - matrices, automated libraries of materials
- *Chen et al*; U.S. Patent Number 5,569,799
- *Li*; U.S. Patent Number 4,710,864
- *Allen et al*; U.S. Patent Number 5,969,121
- *Falb;* U.S. Patent Number 5,849,578
- *Lennon et al*; Using a distributed mini-computer network to automate a biochemical laboratory; Proceedings of the ACM SIGMINI/SIGPLAN interface meeting on Programming systems in the small processor environment; March 1976; Vol. 11, Iss. 4
- *Vogels et al;* U.S. Patent Number 6,340,595
- *Meredith, Jr.;* U.S. Patent Number 5,812,405
- *Ngo;* U.S. Patent Number 4,981,961
- *Sudol et al;* U.S. Patent Number 6,034,212
- *Highland;* U.S. Patent Number 4,924,408
- *Yokota et al;* U.S. Patent Number 4,937,755
- *Paradies et al;* U.S. Patent Number 5,119,318
- *Landers;* U.S. Patent Number 5,136,523
- *Takatori;* U.S. Patent Number 5,581,659

- *Schulze Horn et al;* U.S. Patent Number 5,727,127

- *Gipson;* U.S. Patent Number 5,754,737

- *Arci et al;* U.S. Patent Number 5,761,381

- *Bone et al;* U.S. Patent Number 5,778,154

- *Lenz et al;* U.S. Patent Number 5,815,638

- *Mihatsch;* U.S. Patent Number 6,029,157

- *Dorsett, Jr.;* U.S. Patent Number 6,658,429

- *Schultz et al;* U.S. Patent Number 6,004,617

- *Lee et al*; Statistical experimental design for MBE process characterization; Nineteenth IEEE/CPMT Electronics Manufacturing Technology Symposium; 14-16 Oct. 1996; pp 378-385

- *May et al*; Recipe synthesis for PECVD SiO2 films using neural networks and genetic algorithms; 46th Proceedings Electronic Components and Technology Conference; 28-31 May 1996; pp 855-860

- *Vanrolleghem*; The adaptive sensor concept: on-line modelling of the activated sludge process with optimal in-sensor-experiments; Proceedings of the Third IEEE Conference on Control Applications; 24-26 Aug. 1994; pp 1017-1022; vol. 2

Any inquiry concerning this communication or earlier communications from the Office should be directed to Meltin Bell whose telephone number is 703-305-0362. This Examiner can normally be reached on Mon - Fri 7:30 am - 4:30 pm.

If attempts to reach this Examiner by telephone are unsuccessful, his supervisor, Anil Khatri, can be reached on 703-305-0282. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

MB

Wilbert L. Starks, Jr.
Primary Examiner
Art Unit - 2121